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10/535,567	05/19/2005	David Frank Davies	H0027651/4582/110424	7705
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EXAMINER				
EOM, ROBERT J				
ART UNIT		PAPER NUMBER		
1772				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentservices-us@honeywell.com
pmvdocket@welshkatz.com
paul.vargo@huschblackwell.com

Office Action Summary

Application No.

10/535,567

Applicant(s)

DAVIES ET AL.

Examiner

ROBERT EOM

Art Unit

1772

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 54-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 54-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/200)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 54-60 have been considered but are moot in view of the new ground(s) of rejection.

The applicant has cancelled all previously presented claims, and submitted new claims 54-60 for consideration upon merits for patentability.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 54-56, 59, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howarth (USP 3,481,179), in view of Doncaster et al. (EP 0940680 A2) and Tantram (USP 5,070,721).

Regarding claim 54, Howarth discloses an apparatus for the detection of combustible gases (**Fig 4-5**) comprising: a cylindrical body (*solid molded base*) (**31**) having an electrode mount (*insulating layer*) (**34**) which is made of a suitable insulating material (**C3/L45-47**); a plurality of lead-in wires (*metal lead frame*) (**37s, 39s**); two gas sensitive elements (*gas sensors*) (**36, 39**); a plurality of contacts which are coupled to the gas sensitive elements and coupled to the lead-in wires (**see: contact wires which extend perpendicularly from the direction of the lead-in wires 37, 38 to which the connect gas sensitive elements 36, 38 are connected thereto**); a ring (*perforated cover*) (**56**) which encloses/contains the components held within the body.

Howarth does not explicitly disclose a second insulating layer overlying the sensor. Doncaster teaches a catalytic gas sensor (**Fig. 1-4**) comprising a plurality of gas sensitive catalytic beads (**1**) insulated by being encapsulated by glass microfibre insulating material (**9**). It would have been obvious to one having ordinary skill in the art at the time of the invention to use glass microfibre insulating material to envelope the gas sensitive elements of Howarth, as taught by Doncaster, since doing so provides for

thermally insulating means around the gas sensing elements so that it is operable at a relatively high temperature (**Doncaster: [00020]**).

Howarth does not explicitly disclose the metal lead frame being disposed parallel to the floor of the cavity. Tantrum teaches a flammable catalytic gas sensor (**Fig. 1**) having leads (**6**) which are disposed in a direction parallel to the floor of the sensor housing. It would have been obvious to one having ordinary skill in the art at the time of the invention to arrange the leads in the aforementioned parallel manner in the gas sensor of modified Howarth, as taught by Tantrum, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 55, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses a charcoal pad diffuser (**44**). Doncaster further discloses a bronze sinter (**10**) which reacts with hydrogen sulfide to prevent it from reaching the bead.

Regarding claim 56, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses a second diffuser (**57**) which can act as a flame trap. Doncaster further discloses a stainless steel sinter (**12**) to act as a flame trap.

Regarding claims 59 and 60, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses the ring (*metal bezel*) (**56**) is fixed by screws to the sensor body (**C4/L10-12**) and encloses/contains the components held within the body.

6. Claims 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howarth (USP 3,481,179), in view of Doncaster et al. (EP 0940680 A2) and Tantrum (USP 5,070,721), as applied to claims 36, 37, and 40 above, in further view of Otani et al. (JP 2002-295795, **see: related US Patent 7,479,255 B2**).

Regarding claim 57, modified Howarth discloses all of the claim limitations as set forth above. Modified Howard does not explicitly disclose a second filter located between the cover and the second insulating layer, with the flame arrestor mesh disposed between the two filters. Otani discloses a gas sensor (**JP: Fig 15; USP: Fig, 20**) comprising: a water repelling filter (**44**) disposed between the sintered porous metal sheet (*flame arrestor mesh*) (**43**) and the cap (**60**). It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a second filter in the form of a water repelling filter onto the flametrap of modified Howarth, as taught by Otani, since doing so prevent moisture from entering the gas sensor which prevents gas sensing element breakdown and sensitivity lowering and prolong the life of the gas sensor (**Otani USP: C2/L66-C3/L3**).

Regarding claim 58, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses the ring (*metal bezel*) (**56**) is fixed by screws to the sensor body (**C4/L10-12**) and encloses/contains the components held within the body.

7. Claims 54-57, 59, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doncaster et al. (EP 0940680 A2), in view of Howarth (USP

3,481,179), Daeche et al. (WO 00/00820 see: English language translation), and Tantrum (USP 5,070,721).

Regarding claim 54, Doncaster discloses a gas sensor (**Fig. 1-3**) comprising: a housing (**Fig. 3, see: stainless steel housing 11**) having a closed base and an open end, the housing having walls that surrounds and a cavity with said base (**Fig. 3, see: volume created by housing**); the cavity having an upper first shelf (**Fig. 3, see: "shelf" defined by walls of housing**) and an integral floor (**Fig. 1-2, see: base 8**); a all-metal lead frame comprising four terminals (**Fig. 2, see: terminals 6, 7 for each can 2**) and three lead lines which extend out of the base of the housing (**Fig. 3, see: three leads extending from bottom of gas sensor**); a pair of detectors mounted in the cavities and connected through the lead lines (**Fig. 2, see: catalytic bead 1**); a pair of filters (**Fig. 2, see: bronze sinter 10**); and a metal mesh flame arrestor (**Fig. 3, see: stainless steel sinter 12**).

Doncaster does not explicitly disclose the housing being made of plastic, or a porous metal cover to close the housing. Howarth teaches an apparatus for the detection of combustible gases (**Fig 4-5**) comprising a ring (**56**), fixed by screws to the sensor body (**C4/L10-12**), which encloses/contains the components (gas sensitive element, flame trap, diffuser, etc.) held within the body. It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a retention ring in the gas sensor of Doncaster, as taught by Howarth, since doing so would provide a mounting system which would prevent the flame trap and other critical components

from separating from the housing due to temperature fluctuations, which causes the housing to expand and shrink in size, from the sensing of combustible gases.

Daeche teaches a combustible gas sensor (**Fig. 1-7**) with a housing manufactured by molding plastic directly onto a lead frame (**P5, see: plastic spraying process**). It would have been to one having ordinary skill in the art at the time of the invention to use select plastic as the material for the housing in the gas sensor of Doncaster, as taught by Daeche, since doing so allows a cost advantageous mounting and large-scale manufacture of combustible gas sensors (**Daeche: P4, see: paragraph 3**).

Doncaster does not explicitly disclose the metal lead frame being disposed parallel to the floor of the cavity. Tantrum teaches a flammable catalytic gas sensor (**Fig. 1**) having leads (**6**) which are disposed in a direction parallel to the floor of the sensor housing. It would have been obvious to one having ordinary skill in the art at the time of the invention to arrange the leads in the aforementioned parallel manner in the gas sensor of modified Doncaster, as taught by Tantrum, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 55, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses the cavity has a first recess surrounded by a second shelf (**Fig. 2-3, see: volume defined by the walls and “shelf” of the can 2**) which extends to the all-metal electrical conducting lead frame; a second recess (**Fig. 2, see: volume defined by well formed in the base 8 which also forms a second**

“shelf”) which extends below the upper most plane of the all-metal electrical conducting lead frame; the recesses of the can containing insulating material (**Fig. 2, see: glass microfibre insulating material 9**), the detector (**Fig. 2, see: catalytic bead 1**) being mounted in the second recess to the first and third lead lines through an intermediate section which extends toward the center of the housing base and toward each other and separated from each other, and the second lead line having an end adjacent and separated from the first intermediate section (**Fig. 2, see: terminals 6, 7 which extend towards the center of the housing and to each other are intermediate between the three lead lines seen in Fig. 3 and the catalytic beads 1**).

Regarding claim 56, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses a second layer of shock absorbing and insulating material located inside the first recess and above the detector (**Fig. 2, see: glass microfibre insulating material 9**).

Regarding claim 57, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses the filter rests on the second shelf over the first recess (**Fig. 2, see: bronze sinter 10**).

Regarding claim 59, modified Doncaster discloses all of the claim limitations as set forth above. Howarth further discloses the ring (*metal bezel*) (**56**) is fixed by screws to the sensor body (**C4/L10-12**) and encloses/contains the components held within the body.

Regarding claim 60, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses the first element, second element, and second layer being glass wool (**C2/L54-60**).

8. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doncaster et al. (EP 0940680 A2), in view of Howarth (USP 3,481,179), Daeche et al. (WO 00/00820 see: English language translation), and Tantram (USP 5,070,721), as applied to claims 45-48 above, in further view of Otani et al. (JP 2002-295795, **see: related US Patent 7,479,255 B2**).

Regarding claim 58, modified Doncaster discloses all of the claim limitations as set forth above. Modified Doncaster does not explicitly disclose a second filter located on the outboard side of the flame arrestor. Otani discloses a gas sensor (**JP: Fig 15; USP: Fig, 20**) comprising: a water repelling filter (**44**) disposed between the sintered porous metal sheet (*flame arrestor mesh*) (**43**) and the cap (**60**). It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a second filter in the form of a water repelling filter onto the flametrap of modified Doncaster, as taught by Otani, since doing so prevent moisture from entering the gas sensor which prevents gas sensing element breakdown and sensitivity lowering and prolong the life of the gas sensor (**Otani USP: C2/L66-C3/L3**).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **ROBERT EOM** whose telephone number is (571)270-7075. The examiner can normally be reached on **Mon.-Thur., 9:00am-5:00pm, EST**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Insuk Bullock can be reached on (571)272-5944. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1774

/R. E./
Examiner, Art Unit 1772